

Remarks

The composition of the present invention comprises a unique combination of components, including about 5-55 wt% metal-doped anionic clay and about 5-40 wt% matrix alumina. The term "metal doped anionic clay" has a special meaning as explained in the second full paragraph on page 7 of the instant text, which is anionic clay prepared by a process wherein the metal additive(s) is/are present during the formation of the anionic clay. This is distinguished from impregnation that is performed after the formation of anionic clay has been completed.

These metal-doped anionic clays are prepared by aging an aqueous suspension of divalent and trivalent metal source, at least one of them being water-insoluble, optionally followed by thermal treatment, i.e. calcination, and rehydration to form anionic clay again. The dopant is introduced during one of these steps (page 7, lines 21-26).

The thermal treatment can be conducted at 150-900°C (page 8, lines 25-28). Anionic clays, e.g. hydrotalcite, begin to decompose at a temperature below 200°C, which decomposition is reversible. Due to this reversibility, the thermally treated anionic clay can be transformed into anionic clay by way of rehydration.

Matrix alumina, as explained in the first paragraph of page 5, means that the alumina is present in the continuous phase.

It is also important in preparing the composition of the present invention that the anionic clay is obtained by a process comprising mixing a trivalent metal source and a divalent metal source, at least one of them being water-insoluble, in aqueous suspension. This results in anionic clay having a physical structure fundamentally different than if the trivalent and divalent metal sources are both water soluble and co-precipitated. The unique structure of the anionic clay used

in the composition of the invention will have a positive affect on the performance of the composition of the invention when used to produce gasoline and/or diesel having reduced sulfur content.

The superiority of the catalyst composition of the present invention is amply demonstrated in Example 7 of the instant text, where the use of a Zn-doped anionic clay resulted in a sulfur reduction in an FCC unit gasoline product which was 17% higher than the sulfur reduction resulting from the use of a Zn-impregnated anionic clay.

Rejections Under 35 USC § 102

Claims 1-4 were rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 278 535 ('535). The compositions of '535, such as shown in its example 6, are prepared by calcining anionic clay for 2 hrs. at 600°C, impregnating the calcined material with rare earth metal salts using standard impregnation conditions and calcining the impregnated material for a second time under the same conditions.

A standard impregnation technique is incipient wetness impregnation as used in WO 99/49001, cited in the instant application in the paragraph bridging pages 1 and 2: see WO 99/49001's Examples 1 and 2. Incipient wetness impregnation involves filling the pores of a solid with an amount of solution equal to the pore volume, followed by drying. Hence, incipient wetness impregnation of calcined anionic clay involves contacting of the calcined clay with a calculated, small amount of liquid for only a short time, during which the pores become filled. This is not a rehydration and will not result in the formation of anionic clay again.

'535 mentions on page 4, lines 26 and 27 that rare earth metals may be taken up into the sulfur oxides binding material by coprecipitation of compounds of these metals during the preparation of the anionic clay, but gives no hint to the

requirement of the instant claims that the anionic clay is obtained by a process comprising mixing a trivalent metal source and a divalent metal source, at least one of them being water-insoluble, in aqueous suspension.

'535 therefore does not disclose a composition comprising a metal-doped anionic clay as employed by the present invention and is most definitely not an anticipation of the present invention.

Rejections Under 35 USC § 103

Instant claims 1-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/12570 ('570) in view of '535.

'570 uses shaped bodies containing at least 50 wt% of anionic clay with good binding properties (p. 11, lines 21-29). In these bodies, the anionic clay is the continuous phase, while any other optionally present material, e.g. alumina, is the discontinuous phase (p. 11, line 30, through p. 12, line 5).

However, the composition of '535, like that of the present application, requires the presence of an alumina matrix, which, as discussed above, means that the alumina is the continuous phase, while the metal-doped anionic clay is the discontinuous phase, which situation is opposite to that of '570.

The law is clear that the prior art must show not only all of the elements of the claimed combination, but must contain some "teaching, suggestion or incentive" to a person of ordinary skill to combine the known elements in the way that the Examiner combined them (United States surgical Corp v. Ethicon Inc., 41USPQ 2d 1225, CAFC 1997). The question, therefore, is what teaching, suggestion or incentive is there for one of ordinary skill in the art to combine '570 and '535, while arbitrarily rejecting teachings in those references, such as the use of anionic clay obtained by mixing solutions of trivalent and divalent metal

sources in '535, and the use of alumina in the discontinuous phase in '570 to arrive at the present invention? The simple answer to that question is that there is no such teaching, suggestion or incentive.

'570, like the present invention, is concerned with the problem of the production of gasoline and diesel with low sulfur content. The compositions of '535, however, are used for the binding of sulfur oxides (p.1, lines 1-2), which are formed during the regeneration step of an FCC process (p. 1, lines 9-11). In this regeneration step, coke depositions are burnt from the catalyst and without any precautions the sulfur compounds present in the coke deposits are emitted as sulfur oxides. In '535 these sulfur oxides are adsorbed by the anionic clay-containing composition disclosed therein.

'535 does not disclose the production of gasoline or diesel low in sulfur or nitrogen. Although it says in the paragraph bridging pages 6 and 7 that the catalyst is suitable for cracking sulfur-containing hydrocarbon feeds, it does not mention that the use of this catalyst results in the production of compounds with a low sulfur content. Therefore, the purposes or problems to be addressed in '535 differ from those of '570, which is concerned with the problem of the production of gasoline and diesel with low sulfur content, and these differences preclude any teaching, suggestion or incentive to combine '570 and '535.

Of course, even if '570 and '535 were somehow combined, the essential requirement of the anionic clay being obtained by a process comprising mixing a trivalent metal source and a divalent metal source, at least one of them being water-insoluble, in aqueous suspension would still be lacking.

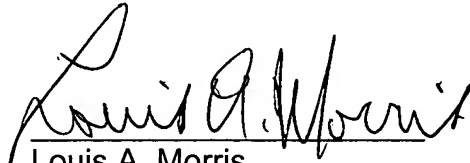
Claim 1-4 and 10-14 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Stamires et al. (2002/0159940) in view of '535. However, the subject matter and the claimed invention of Stamires et al. were, at the time the invention was made, owned by the same person or subject to an obligation of

assignment to the same person, and thus Stamires et al. does not qualify as prior art (35 U.S.C. 103 (c)). Both Stamires et al. and the instant application were subject to being assigned and have been assigned to Akzo Nobel N.V.

Conclusion

The present invention is neither anticipated by nor is it obvious over the prior art. An early allowance of the instant claims is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Louis A. Morris". The signature is written in a cursive, flowing style with a horizontal line underneath the name.

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